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Which Switch for AoIP?

IP audio networks are very different from standard enterprise or office networks in almost every way, but none more spectacular than the nature and volume of traffic.

For this reason, the Ethernet switches used in an IP audio network like WheatNet-IP need to have a high-capacity fabric, which is the actual mechanism that allows the switch to pass data among its ports. There are different ways that switches handle traffic – store and forward, cut-through, fragment-free, adaptive switching – but regardless of fabric used, it needs to be of sufficient capacity to handle full bandwidth traffic without blocking. Also imperative: the switch needs to be a managed switch and it has to be able to snoop IGMP packets and switch them appropriately. Otherwise, multicast traffic is going to flood everywhere. For other tips and an in-depth look at switches for IP audio networking, go to:

For the entire story... INN23.wheatstone.com

IP Consoles 101

Sometimes, even we forget that our IP networked consoles don't actually have live audio in the board itself. (That's why we call them control surfaces – so we'll remember that they control the audio, not store it!)

Shown is web radio OWWR's number-one studio with IP-12 control surface, M-2 dual mic processor, and just the right amount of WheatNet-IP audio networking. Check out those baby-proof covers on the Tripp-Lite power module!

We don't envy guys like Joseph Manfredi, who has to explain IP control surfaces to a group of new students every year as a faculty member in the American Studies/ Media & Communications department and station manager for OWWR web radio at SUNY College in Old Westbury, New York. "I'll never convince them that there's nothing under that fader," says Joe, referring to the station's new IP-12 control surface.

Joe has four studios that he teaches out of and streams 25 live shows from weekly, the most up-to-date one being his "Studio A," with the IP-12, M-2 dual-channel mic processor and WheatNet-IP audio network that he and his chief engineer installed last year. The IP-12 is an ideal entry into AoIP for small studios, providing a self-contained digital audio board with WheatNet-IP audio network BLADE engine for flexible access to sources and destinations. "My 'yesterday' studios look and function okay, but this is the one that gets it done," says Joe.

For the entire story... INN23.wheatstone.com

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Studio T has a three-wall cyclorama painted chroma green. The carpeted floor is removable, allowing full keying of the set.

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2015 BEST of SHOW Radio 35

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FIND THE MIC AND WIN!

Tell us where you think the mic icon is placed on this issue's cover and you could win a Hosa USX-110 mic-to-USB interface. Send your entry to radio@RadioMagOnline.com by July 5. Be sure to include your guess, name, job title, company name, mailing address and phone number. No purchase necessary. For complete rules, go to RadioMagOnline.com

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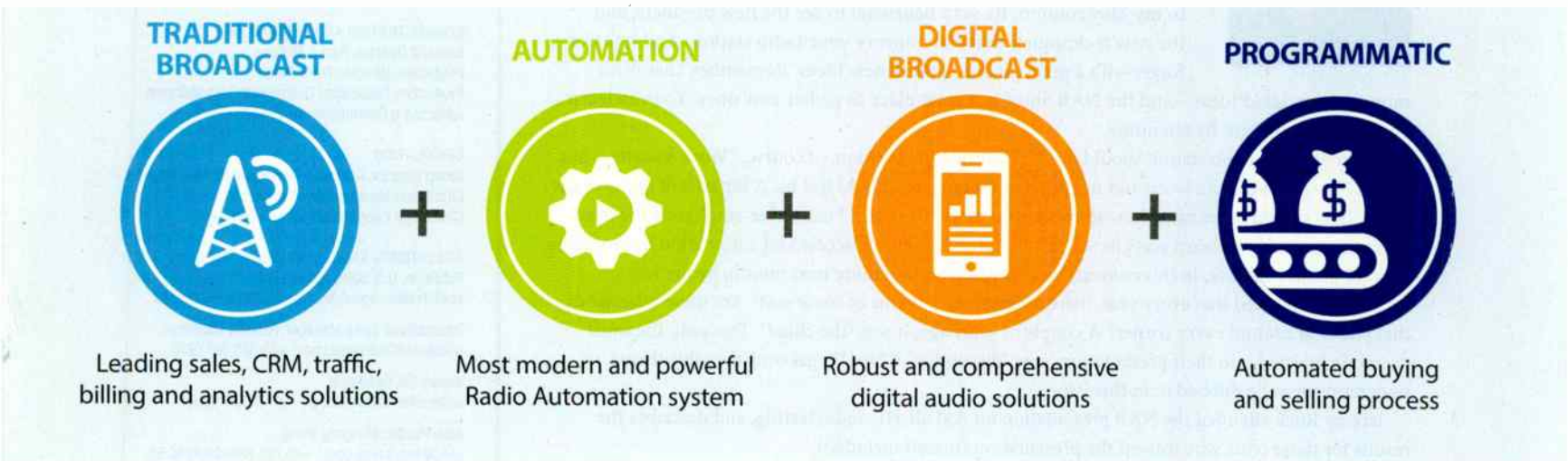

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VIEWPOINT

Must-Attend, Must-Learn, Must-Reads

Fast month I mentioned that I had just gotten back from the NAB Show, and said little else about it. June has historically been the month that Radio covers the convention. This gives us a little time to recover and to put together our articles and features that are specific to the show.

The NAB show is a "must-attend" event, in my view. As I mentioned in my May column, it's very beneficial to see the new products, and the new techniques, that can improve your radio station. And let's not forget—it's a great place to gather new ideas. Remember, there's no monopoly on good ideas—and the NAB Show is a great place to gather new ones. You can learn an incredible amount by attending.

Improving the radio station should not be your only motivation, of course. "Work smarter—not harder" may sound like a worn-out mantra, but it's one you should live by. A big part of going to the NAB Show should be learning how to make your work life easier. I can't over-emphasize the need for many engineers to learn ways in which to implement remote access and automation in processes (not for audio playback, in this context). We'll talk about that more next month, by the way.

Have you noticed that every year, there seems to be a theme of some sort? Are there buzzwords that you hear around every corner? A couple of years ago, it was "the cloud." This year, the word everyone injected into their presentations was "disruptive." Chris Wygal considers this theme, or undercurrent as he dubbed it, in this issue.

Jeremy Ruck attended the NAB presentation on AM all-HD radio testing, and describes the results for those of us who missed the presentation (myself included).

We also have coverage of the winners of Radio's Best of Show 2015 awards — please check those out to get more highlights from the exhibit floor.

We're presenting a new studio construction project taken on and conquered at the IMPACT radio and TV facility in Atlanta. You'll notice a lot of emphasis on video there; that's fairly commonplace nowadays. If you're asked to add video to radio, check out what they've done. You'll be inspired.

Scott Bridgewater is back this month, with a compelling tale about the invention of the content index, and how it pertains to your everyday life. (IT people were around, even in ancient Egypt, it seems.)

Lee Petro discusses a very interesting issue in his column—that of foreign ownership of radio stations. Does the recent Pandora ruling portend changes in the FCC's policy?

This edition of Tech Tips is a continuation of last month's topic — how to get your shop ready for work.

And to round things out, the Wandering Engineer discusses the makeup of GMs. Why is it so few general managers start off their careers as engineers, anyway?

I also want to let you know that we're working very hard in making Radio an interesting read every month. Towards that end, we've developed a very short survey that I'm inviting you to take. Please browse to this location: *https://www.surveymonkey.com/s/XKLYSG3* and fill it out. It's very short—you can easily do it while downing a single cup of coffee. We need this feedback so that we can continue "tuning up" Radio, more to your liking.

(It isn't meant to take the place of the Salary Survey by the way—that's coming up later this year.)

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EDITORIAL
Technical Editor: Doug Irwin, CPBE DRB AMD
Managing Editor: Emily Reigart

CONTRIBUTORS
Fred Baumgartner, Russ Berger, Scott Bridgewater, Lee Petro, Jeremy Ruck, The Wandering Engineer, Chris Wygal

CORPORATE
President and CEO: Steve Palm
Chief Financial Officer: Paul Mastronardi
Controller: Rick Ng
Group Circulation Director: Denise Robbins
Vice President of Web Development: Robert Ames

VIDEO/BROADCAST GROUP
Executive Vice President: Carmel King
Vice President of Sales/Group Publisher: Eric Trabb

ADMINISTRATION AND PRODUCTION
Editorial Director: Paul J. McLane
Production Director: Davis White
Production Publication Coordinator: Lisa McIntosh
Advertising Coordinator: Caroline Freeland

CIRCULATION
Group Director, Audience Development: Meg Estevez
Circulation Manager: Kwentin Keenan
Circulation Coordinator: Michele Fonville

ADVERTISING SALES REPRESENTATIVES
Publisher, U.S. Sales: Steven Bell
sbell@radiomagonline.com | 212-378-0400 x519

International Sales Manager: Rafaella Calabrese
rcalabrese@nbmedia.com | +39 320 8911938

Japan: Eiji Yoshikawa
callems@world.odn.ne.jp | +81 3 3327 5759

Asia-Pacific: Wengong Wang
wwg@imaschina.com | +86 755 83862930/40/50

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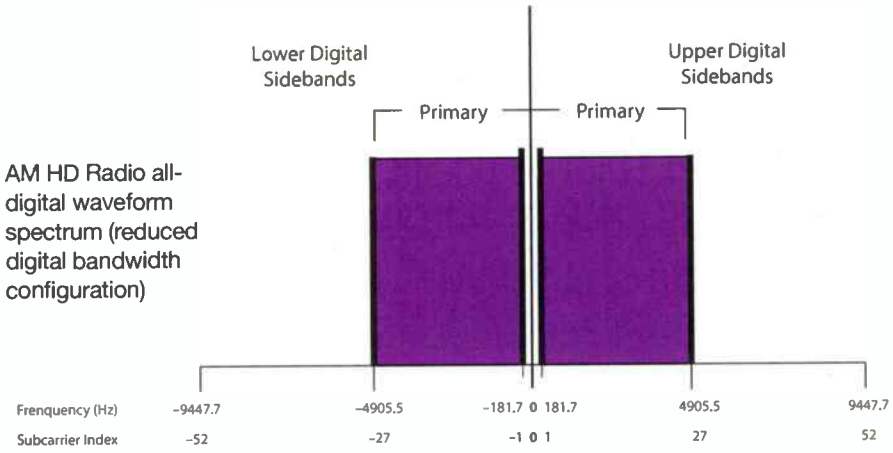
What Is the Status of All-Digital AM?

by Jeremy Ruck

At about this time last year, the all-digital future of AM radio was pondered in this column. In that article, I stated that moving toward all-digital and dumping the hybrid mode was the way to go.

The intervening year and 2015 NAB Engineering Conference have only served to galvanize that opinion even more.

This year, David Layer provided additional information on the ongoing field-testing that NAB Labs has been undertaking for several years. The field-testing has wrapped up; however, additional projects continue. The field testing results have been spectacular thus far, and really serve to illustrate why this is a viable concept, despite the shrinking chorus of naysayers from the peanut gallery.



AM HD Radio all-digital waveform spectrum (reduced digital bandwidth configuration)

It is important to remember that all-digital is currently only authorized for experimental purposes by the commission. Therefore, anyone not connected with the field tests, in the reception area of one of the nine stations utilized for testing or in attendance at one of the recent presentations has likely based their opinion on experience with the hybrid or MA1 mode. The current MA1 mode was always intended to be a stepping-stone to the full digital MA3 mode and does not reflect the true benefits of the scheme.

MA1 MODE

In a nutshell, the field-testing essentially demonstrated that the all-digital mode works under all circumstances where the analog mode functions. Additionally, coverage under all-digital is very similar to that under analog. In many cases, the field-testing demonstrated that the all-digital coverage exceeded the analog mode.

One very interesting observation made during the testing performed in the Twin Cities metro area was that the all-digital mode experienced no dropouts on the test runs, while the hybrid mode experienced a substantial number.

Given that in the MA1 mode the digital carriers exist from roughly 10 to 15 kHz out from the carrier frequency, this may not be all that surprising. For in that region, there are adjacent stations operating, and their interference can certainly plague the operation of the digital sidebands. When in the MA3 mode, the carriers are located within 10 kHz of carrier, and if the secondary and tertiary are dropped, are within 5 kHz of the carrier. It should be self-evident that in confining the information to that chunk of real estate would reduce such events.

It has often been said that an AM antenna is a living, breathing animal, and as in the case of its biological analog, no two are identical. With this in mind, the question could be posed as to whether or not NAB utilized a broad enough sample to definitively say that the all-digital will work universally. After all, as of March 31, the commission counts 4,702 total AM stations licensed by them.

While that is a fairly large range of possibilities to consider, NAB Labs really did a good job in their sample selection. Stations of all classes were considered. Additionally, non-directional and directional antennas were considered. The sample also included stations located up and down the dial. Although it would have been very interesting to see what happened with tests on one of the big gun class A stations like WLS, WGN or WBBM, testing on WBT in Charlotte was certainly illustrative.

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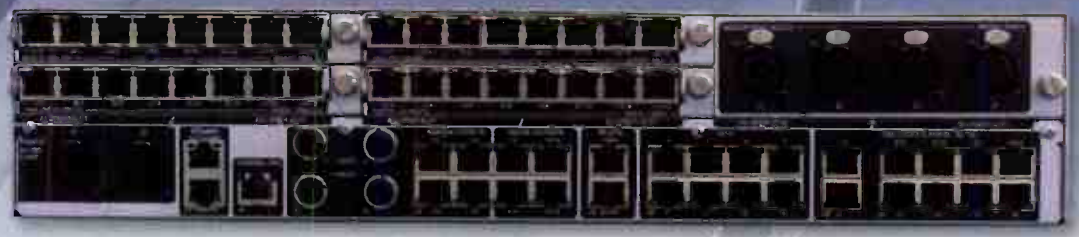

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MA3

A question in the back of my mind after the 2014 presentation was how well MA3 would work for skywave coverage situations. The testing performed at WBT demonstrated that it would indeed function very well.

But, since skywave signals are inherently variable, some differences in quality were noted. In the 2015 presentation, audio clips were presented comparing both the analog and MA3 modes from WBT as received in the Boston region, and the difference was impressive.

For the testing, the team utilized OEM Ford vehicles, each with a digital-capable radio. No special changes were required to be made to the radios; any current receiver that works with the analog and MA1 modes will also work with the MA3 mode. Since no custom interface was present, audio was taken at a speaker input and fed directly into the computer. Therefore, when audio was present, successful reception of the digital signal occurred. As pointed out in the related paper, one drawback to this technique was determining if silence was due to program breaks or an actual loss of signal. To work around this, a barely audible 25 Hz tone was injected into the audio chain at the station. The recording devices would then look for this tone, and if present, consider that valid reception was occurring.

The operating power for each station was determined through the direct method. In each case, the base current or common point current, depending on the type of station, was adjusted in the MA3 mode to equal the licensed value in the analog mode. The locations of field strength contours were then determined to identify areas where the signal would potentially drop. During the drive tests, actual field strength measurements would then be obtained at the locations where the reception was no longer viable.

These field strength measurements were made with the FIM-41 and PI-4100 models from Potomac Instruments. These meters, however, are designed with a bandwidth that is much narrower than the digital signal being considered. As a result, a correction factor of 3.9 dB was suggested by the manufacturer for measurements obtained with the PI-4100. The necessary application of a correction factor brings up a potentially interesting problem for the future. Ultimately, a field strength meter that does not require the application of correction factors will be necessary.

In addition to the real world, testing that has taken place, and is more or less concluded, there is a laboratory-testing phase that continues. The controlled environment that a laboratory provides is essential in the study of potential changes to allocation standards that may be required. Since the all-digital mode has a greatly reduced bandwidth over the hybrid mode, adjacent channel interference will necessarily be less. Extensive testing of the hybrid mode was performed before its use was even authorized by the commission. As a result, NAB Labs points out, it probably is not necessary to perform additional such testing on the MA3 mode.

TESTING CONTINUES

Additional testing of co-channel interference situations would seem to be warranted. This is due to the fact that the digital sidebands adjacent to the carrier frequency are higher in power. Since the potential time frame of all-digital was below the horizon when the MA1 tests were performed, no co-channel evaluation was considered early on. Also, as Layer points out in his paper, the power spectral density of the MA3 signal is much higher than an analog signal, thus co-channel interference will be greater from an all-digital signal than from its analog counterpart. NAB Labs had not, as of the time of the convention, completed the co-channel interference testing.

Finally, any conversion process involves a fair amount of planning and execution to ensure a smooth transition.

One of the elephants in the room has always been the antenna system. For a single stick non-directional, the conversion should be fairly straightforward. However, with a multiple tower directional array, the costs in labor, resources and sanity can spiral upwards at a robust pace.

If your system is already functional in the MA1 mode, then minimal changes would probably need to be made for MA3 operation. This is due to the fact that the MA3 spectrum occupies less bandwidth than the MA1 mode, and as such is apparently not as taxing on designs.

Current numbers of receivers is above 25 million. That is definitely better than a couple of years ago, but is still well short of the estimated 1 billion analog receivers. All major auto manufacturers now have at least one model available with an HD radio, and many have entry-level vehicles with such technology. Granted, there will be some more time involved before we hit a critical mass on receiver penetration, but that day will arrive.

Translators have been a huge success for AM broadcasters, but they are a bandage over the problem. All-digital AM looks to be the cure for the ailment.

Ruck is principal engineer with Jeremy Ruck and Associates. He is based in Canton, Ill.

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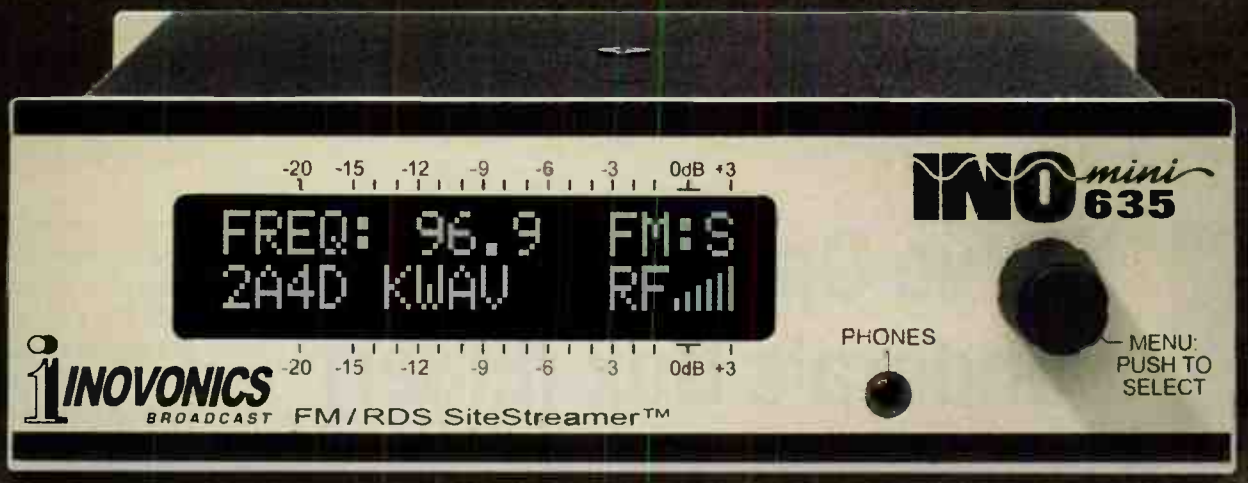

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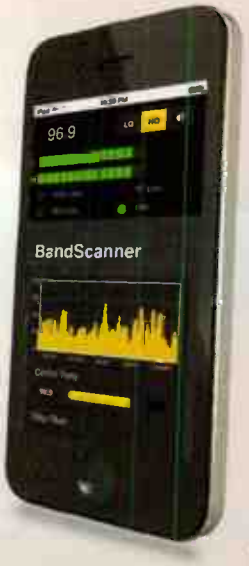

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We've Opened Pandora's Box (Elder)

by Lee Petro

The idea seemed simple: In the wake of growing copyright royalty fees for online music companies, Pandora decided to purchase a small FM station in Box Elder, S.D.

By doing so, Pandora hoped to qualify as a broadcast station licensee — and pay substantially less in royalty fees. While one could foresee that copyright holders would not be pleased by this approach, the real problem at the FCC became one of foreign ownership.

EXPLICIT INTENT

By way of background, online music companies like Pandora and Spotify pay substantially higher copyright fees for streaming music than are required from broadcasters. In fact, Pandora spent approximately 60 percent of its revenue to cover royalty fees in 2012, and its cost-per-performance has increased since then. On the other hand, broadcasters' blanket license fee is a set percentage of a licensee's gross revenue, with certain standard deductions that further reduce the royalty payments.

In light of this situation, Pandora filed an application in 2013 to acquire an FM station in Box Elder, the 255th largest radio market. Rather than shroud its intent, Pandora announced its purpose for acquiring the station, drawing analogies to the iHeartRadio streaming service offered by the broadcaster formerly known as Clear Channel. ASCAP filed a Petition to Deny against the application, arguing that Pandora was attempting to evade its copyright obligations and that it failed to provide that it complied with the FCC's foreign ownership restrictions.

While the FCC gave short shrift to the copyright arguments — noting that ASCAP should raise these arguments in the courts, or request that Congress address the issue — the foreign ownership argument struck a chord with the commission. Over the course of two years, the FCC sought and rejected

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information provided by Pandora to support its certification of compliance with the Communications Act's general prohibition of foreign investment in broadcast stations (25 percent for indirect, 20 percent for direct). The act permits foreign ownership above this limit, but only on a case-by-case basis.

While one could foresee that copyright holders would not be pleased by this approach, the real problem at the FCC became one of foreign ownership.

Since Pandora is publicly traded, proving that its percentage of foreign ownership did not cross the FCC's thresholds proved to be problematic.

First, it tried to conduct a survey of the mailing address for the stockholders. This approach had been used in similar cases for telephone companies, but the commission has rejected this approach for broadcasters due to "different policy concerns." Moreover, the FCC's staff indicated that any shareholder who had chosen to be anonymous must be treated as foreign. Subsequently, Pandora presented to the FCC's staff a Securities and Exchange Commission survey of its shareholders, but that study was rejected because the survey did not include both voting and equity interests.

Because Pandora could not prove the negative to the FCC's satisfaction, it sought relief through a Declaratory Ruling, which would either permit foreign ownership in excess of the statutory limit, or apply the same approach that the FCC uses for foreign-ownership interests in non-broadcast facilities.

GREEN LIGHT

In May, the FCC granted the request for a Declaratory Ruling, and established the requirements for Pandora to eventually obtain the Box Elder license.

In particular, the assignment application will only be processed after Pandora submits documentation that it has taken steps to implement the conditions in the Declaratory Ruling relating to the monitoring of its foreign shareholders, and make to changes to its organizational documents to permit such monitoring.

Pandora has until early August to take these steps and to provide evidence to the FCC. Once the commission is satisfied that all conditions have been met, the assignment application will be processed.

This case highlights the differing approaches to foreign ownership of broadcast and common carrier licensees.

As Commissioner Ajit Pai noted in his separate statement, if Pandora had sought to purchase a non-broadcast license, cable system, a common carrier, satellite video programmer or newspaper the additional monitoring and reporting requirements would not have been imposed. Commissioner O'Rielly urged the FCC to adopt policies to permit increased foreign ownership that would avoid the case-by-case approach used currently. 0

Petro is of counsel at Drinker Biddle & Reath LLP. Email: lee.petro@dbr.com.

DATELINE

June 29, 2015 — Upfront payments due for Broadcast Auction #98 must be received by FCC by 6 p.m. (EST).

July 10, 2015 — Issues/Program lists must be placed in stations' public inspection files.

Aug. 1, 2015 — Stations in California, Illinois, North Carolina, South Carolina and Wisconsin must place their Annual EEO Public File Reports in the station's public inspection file.

Aug. 1, 2015 — Noncommercial stations in California, North Carolina and South Carolina must file Biennial Ownership Reports.

Aug. 1, 2015 — Radio stations in North Carolina and South Carolina with 11 or more full-time employees must file a Broadcast Mid-Term Report (FCC Form 397).

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Observations Post-NAB Show 2015

by Chris Wygal, CBRE

Jim Peck

Crowds gather outside the exhibit floor.

Each April, I have the opportunity to go to the NAB Show in Las Vegas to do some reporting for Radio. It's like "old home week," as we spend three days on the exhibition floor to look at the latest and greatest and chat with all sorts of folks in the industry.

Without fail, a common theme seems to crop up each year. As an example, several years ago studio lighting for video was hot (Not as "hot" as you'd think. LED technology was skyrocketing). Video gadgetry was fairly popular, as were low-profile microphone stands. The theme? Apparently the radio industry was interested in streaming video that year!

Was it a carefully choreographed effort? No. As a matter of fact, the "undercurrent" of each show may go unnoticed. It's actually no more than a phrase I coined myself to describe a subjective assessment. I'm sure each attendee at the convention sees his or own highlights. Hopefully, especially if you couldn't be there, this will serve as a quick insight into what was happening this year at the spring convention.

A QUICK NOTE

Before we delve into what looked to be a common theme on the floor at the NAB show, there was a "stir" created by our friends at Nautel: Multiplexed HD was unleashed. Essentially, toss out the analog space in the FM carrier and you leave space for nine to 15 HD channels.

The platform is in its infancy and many show-goers were curious as to how well it would be accepted by the FCC, iBiquity and listeners. Nautel explained that it simply wants to start industry discussions. But I applaud Nautel for pushing the issue and showing us possibilities.

THE UNDERCURRENT

So what was big this year? What are the industry product developers doing that set a trend at the NAB Show?

It would seem that engineers are increasingly interested in utilizing IP connectivity to monitor and control their sites. IP-based confidence monitoring and control were popular items. As IP service becomes more readily available at remote sites, numerous IP monitoring and control products

IP Monitoring and Control

Manufacturer	Product	What Does It Do?
BW Broadcast Limited	Plan B Encore Silence Monitor and Audio Backup Player	Silence monitor alerts and eliminates dead air
DaySequerra	MAM2 Monitor	Provides detailed confidence monitoring for HD Radio broadcasters
Deva Broadcast	FM/HD Radio & IP Audio Confidence Monitoring Receiver	Full fidelity FM/HD/IP stream audio monitoring
Elenos	AVATAR Remote Control System	Control and multi-layered management of networked transmitters
GatesAir	Intraplex Livelook	Provides detailed troubleshooting metrics for performance-related control of Intraplex IP transport links
Inovonics	SIMON 614 Monitor	Independent audio and metadata monitoring of up to four IP streams
Inovonics	INOmini 635 FM/RDS Site Streamer	Remotely monitors FM and sends detailed email concerning signal problems or loss
Telos Alliance	25-Seven Systems Voltair PPM Watermark Monitoring & Enhancement	Increases likelihood that PPM tones will be heard by PPM monitors in the field
Wheatstone	IP-MTR64 Meters GUI	It monitors the audio levels, signal density, FFT readings and more of a WheatNet-IP network

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*All these broadcast manufacturers now feature StudioHub+ compatible RJ-45 connectors.

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were on display this year to accommodate. (see the table, page 13.)

This trend, as set by industry product developers, not only speaks to AM, FM and HD broadcasting, it speaks loudly to webcasting. For example, the Inovonics SIMON 614 simplifies the monitoring of up to four Web streams.

Radio has evolved from an over-the-air medium only and engineers are required to monitor audio streaming and metadata delivery to phones, cars, laptops and anywhere else an online stream is consumed.

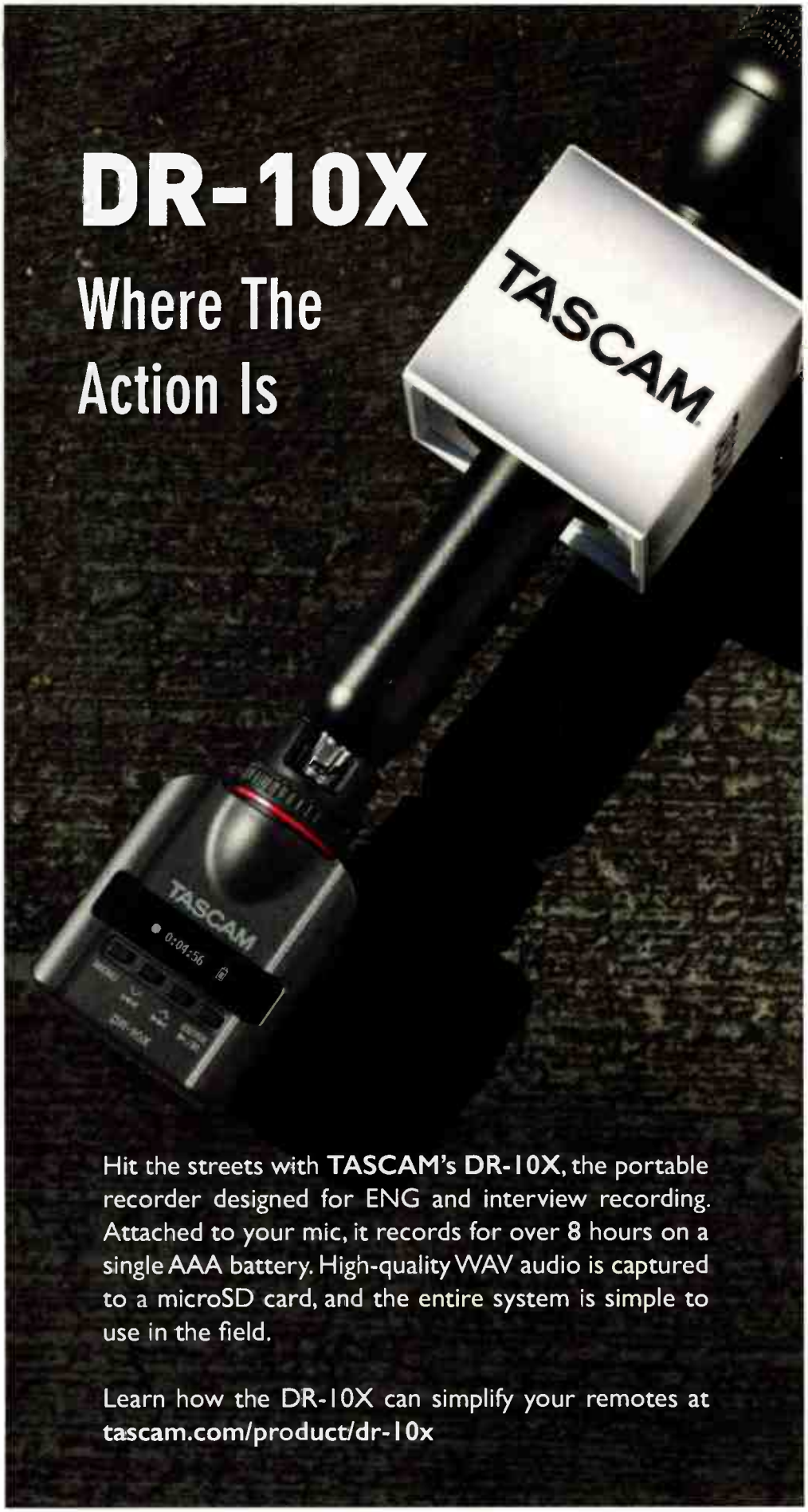
Listeners frequently ask me about the future of radio. I tell them that there will always be radio, but the delivery method will most likely change. When this change happens, engineers will have different propagation methods to monitor and control. This year at the NAB Show, we began to see solutions.

So what do we do when we see a trend pop up each year at the NAB Show? A knee jerk reaction to the next big "thing" isn't generally smart. Conversely, ignoring useful industry changes and evolutions isn't wise, either.

In the case of an upsurge of IP monitoring and control equipment, two strong factors are at play concerning their longevity and vitality. First, Internet protocol isn't going away. Second, we have more than dead air to keep an ear on. PPM watermarking, metadata, IP streaming and HD channels have been added to the business of radio and having the ability to monitor and control all of it on multiple layers is more and more critical.

Hopefully the show this year proved to be a relief for engineers as these confidence monitoring and control products made a sizeable impression!

Wygal is the operations manager for The Journey Radio Network in Virginia.



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TASCAM DR-10X Compact Linear PCM Recorder

by Steve Gregory

The latest addition to the electronic newsgathering world is one of TASCAM's smallest professional field recorders yet: The DR-10X.

As a radio journalist, I was intrigued by the design, which features a single XLR input suitable for dynamic microphones, mult-boxes and lavalier mics (with external power). The whole unit fits in the palm of your hand.

I'm a fan of recorders with bigger buttons and screens. But, after three months of use in the field, I have adjusted to the smaller screen and

Steve Gregory, at right, on scene with DR-10X

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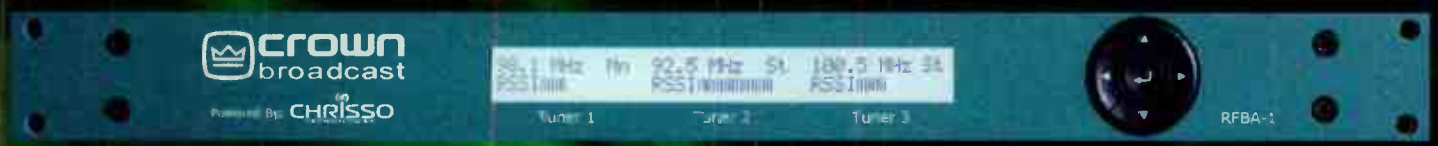

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The DR-10X's small form factor is demonstrated.

buttons. Only one line of text fits on the tiny screen. I would prefer a stronger screen illumination in bright sunlight. The power/record button is on the side, as well as the volume button, and menu buttons are on the front. It's all pretty user-friendly. There is a mini-output jack for headphones. I even used the headphone output jack to feed audio via live truck back to the station.

The DR-10X was ready for use within a couple minutes after I removed it from the box. I'm using an 8G microSDHC card, which is plenty of space, considering it records only in PCM. One of the more unique features is the optional dual track record function. This clean "safety track" records at –6 dB below the main channel and can be retrieved if you need it. It uses one AAA battery.

I do experience pre-amp hiss. This wasn't a surprise because it's only $179. I usually do a quick filter pass though my editing software, and it sounds fine. The mic pregain has three settings, low, mid and high. I find myself using the mid setting for most fieldwork.

I use the DR-10X with my Sennheiser MD-46 for one-on-one interviews and recently used a Sony ECM-44B lavalier mic for a police ride-along. I was pleased that I could have the same capabilities of a wireless transmitter without the hassle of frequencies or dropouts. I

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You must undergo it."
~Albert Camus

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wired the officer, and he put the DR-10X in his pocket. With the button lock and 8–10 hour battery life, it was a great way to grab sound.

Recently, I experimented using the DR-10X with a Sennheiser MKE-600 Shotgun Mic attached to a mic boom pole. I used the low mic gain setting and the results weren't bad at all.

I've also used the DR-10X with mult-boxes and the results were just fine. Double check the box's line/mic settings and adjust accordingly. The recorder also has auto limiter and auto gain. If you rely on time cues/tracks during recording, you can use a smartphone's stopwatch function — just sync the start of recording with the phone.

The recorder comes with a microB USB cable, which you can use to download files. You can also remove the microSD card and use it with a desktop or laptop computer via an SD card adapter. Both methods worked fine, although I found the cable more efficient since I also use the DR-10X to record my voice track in the field.

Steve's view of California Assemblyman Mike Gatto

I've dropped the DR-10X twice on pavement, and it still works fine. It would be nice to have some sort of belt clip or connector to attach to a gear bag or shoulder strap.

The small size makes it ideal for travel, especially for carryon luggage. It's a lot more convenient to have mic and recorder at the ready without the hassle of cables, connectors, adapters or loose mini-plug jacks.

I plan to get a second DR-10X to use for sit down interviews and other field ENG.

With such an affordable price, the DR-10X should a great addition to anyone's ENG kit, especially if you're a radio journalist.

Gregory is a reporter at KFI(AM) in Los Angeles. Steve can be reached at: stevengregory@iheartmedia.com.

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Limited Space and Quick Turnaround Are Hallmarks of Impact Partnership Build

by Marc Lehmuth and E.C. Hamilton

Studio T Control is the TV studio control room. From front to back: teleprompter control, audio board, lighting control and video operator.

The idea of financial talk radio is not new, nor is the idea of building a broadcast production facility in an office building. Nonetheless, our attempt to insert a radio/TV production facility into an already rapidly growing company's office space, with no down time and little disruption, was not an everyday task.

The Impact Partnership is a key distribution partner for 14 U.S. insurance, investment and annuity companies. We educate advisers and agents on financial products and help them to reach more prospects through comprehensive marketing. Many of these advisers market through radio and television. We produce more than 100 custom radio and television shows, advertisements and national celebrity interviews each week.

Most broadcast engineers will face the challenge of planning and installing broadcast production facilities into a working office space at least once in their careers. Sometimes we have the luxury of creating a new facility in a new location. We did not have that option, and we needed to fit months of planning into a few weeks. Not only did the project need to be completed as quickly as possible, but we also had to work with architects and contractors who had never built facilities such as this one before. We had to teach our architect about sound control walls, acoustic materials and soundproof windows. The electricians installed miles of conduit from two rack rooms to 11 studios with conduits for on-air lights, speaker locations and TV studio lighting control and power; camera location boxes; a 15 KVA UPS; five new HVAC units; and more than 48 dedicated-isolated circuits. The HVAC contractor was taught about sound isolation and the need for individual temperature control in each studio.

ACCOMODATIONS

We knew right from the beginning that the furniture design would be one of the toughest obstacles, due to the limited space and quick turnaround. All of the studios had to accommodate at least two people, such as a host and a board operator. Two of our larger studios needed capacity for six to seven people. Since we were putting broadcast cameras in one of our radio studios, we decided that the furniture needed to be both functional and visually appealing.

We contacted David Holland at Omnirax Furniture Company to start the design process. Omnirax is able to accommodate many types of materials and the sweeping curves in their builds would provide the look we wanted.

For our main Studio A, we designed a five-microphone-position table, which is composed of four pieces. The base: a semicircle unit with four access doors that contains the signaling, A/C wiring, five Rolls MB15B Promatch, two power strips, two network blocks and a logic block centered over a 2-inch conduit located in the floor from the rack room. The host position: a half-moon-style top, made from white Arctic

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Ice Corian, holds an ESE ES520U timer/clock, a Wheatstone TS-22 and a 2RU rack attached to the underside for a Wheatstone IP88a.

Guest positions two through five are composed of curving pieces of black Anthracite Corian. Each guest position has a Wheatstone TS-4 and an Altinex TNP121C pop up access block. These pop-up blocks house the connections for business net data line, power, headphone outs and inputs for the auxiliary audio inputs. The top of the table has three Yellowtec MMS poles, one on each side and one on the middle, that hold five M!ka On-Air Mic TV arms. The MMS pole in the middle also holds a 22-inch monitor for the host position.

Server Room 407 has two racks dedicated to radio. Middle Atlantic DRK series racks had cable management in the front and back, giving it that finished look.

The table also features six custom legs with blue powder coated outer shell, laser-etched with our logo and powder-coated white on the inside. We installed RGB LEDs on the inside to create a cool effect through the laser-etched logo. (It's a small detail, but it gets noticed quite frequently.) Along with the LEDs in the legs, we wired more RGB LEDs under the tabletop to serve as in-studio on-air light; they are green when the microphones are off and red when they are on.

We topped Studio A with JBL Control 26C and Control 19C recessed ceiling-mounted speakers powered by a Powersoft Ottocanali 1204 amp, located in the rack room. We used the remaining channels of this amp to power three Soundtube Entertainment FP6020 dome speakers located outside the windows of Studio A, Studio C and the HD monitors outside the TV studio. We installed an Electronic Theater Controls 7066A lighting track system

FACILITY FOCUS: WHAT'S INSIDE IMPACT PARTNERSHIP

Omnirax

Omnirax is proud to have been a partner on this exciting 10-studio project. We worked closely with Impact's staff, including industry veteran Marc Lehmuth and E.C. Hamilton, to maximize Omnirax's unique collaborative design process.

True to their name, Impact Partnership wanted their main talk studio to make an impactful, lasting impression in addition to being video-friendly. We employed our Shapes line to build a stunning piece, Corian countertops cantilevered from a semi-circular "technology arc" with custom laser cut and branded legs on the perimeter.

The remaining studios were Innova Custom Line furniture, the solution for a project with some unique challenges: A long narrow control room for their TV studio and several small production studios.

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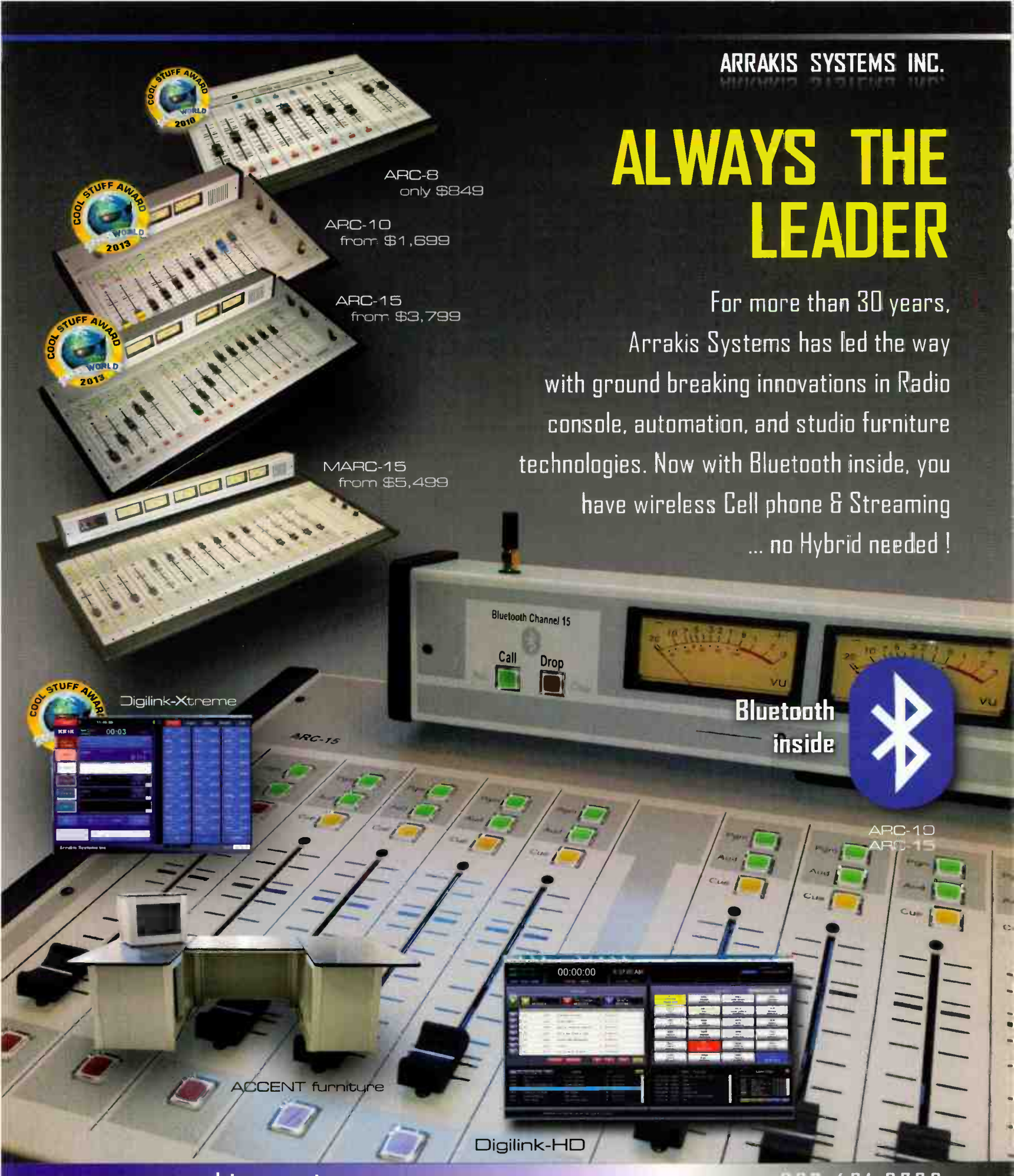
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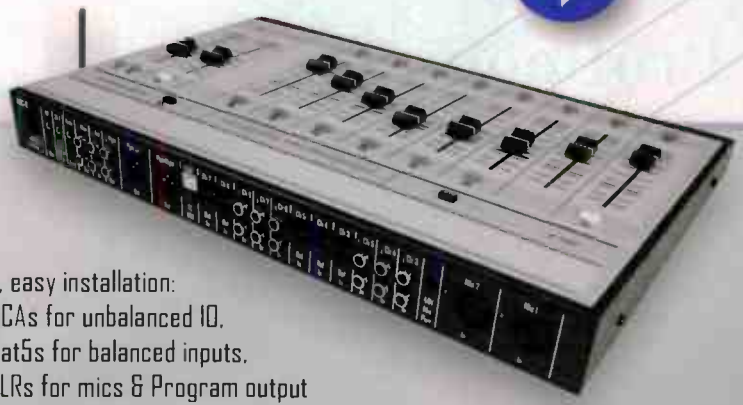

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in Studio A with 16 ETC D22 DMX track mount lights, and six ETC Source Four Mini track mount lights on 10 tracks, all controlled by Interactive Technologies DMX controllers.

Studio B is the control room for Studio A and makes use of a stand-up configuration. Two Neumann KH120A wall-mounted speakers with Yellowtec Mika 3301 microphone arms and dual 3229 monitor arms frame the Wheatstone LX24 console. We wanted to make sure to display some of the gear that might normally live in a rack room, as well as give the viewer an authentic broadcast studio look. David Holland designed a large turret to showcase two Wheatstone M4 blades, a Comrex Access, a Tieline Merlin Plus, a CD player and a Furman M8DX Power Conditioner. We completed the studio with a VoxPro and Adobe Audition monitors.

All of our studios have a 24-by-24 inch or a 16-by-16 inch in-wall junction box with two or more 3-inch conduits to one of the two rack rooms; a 1-inch conduit to the on-air lights located outside each door; and a 1-inch conduit to speaker location (if needed). A large opening was cut in the lower back panels to make room

Kevin Steele is shown in Studio D's control room.

for the junction boxes that were located before the furniture was fabricated. All the lower racks throughout the facility have Middle Atlantic SRS or SRSR slide out rail systems to facilitate wiring and maintenance. The racks house the Wheatstone IP88 blades, M4 and M2 processors, a Furman M8DX Power Conditioner, and rack drawers and space for future expansion.

Taking advantage of Holland's expertise and attention to detail, we were able to design locations for everything in the studios, with clear

World Radio History

and precise wiring paths and mounting areas, without the need to cut the furniture after the fact. In Studio C, we have a simple four-person talk table. To help save space, Holland suggested cutting small half-moon indentions for seated positions. This allowed us to have an average of three feet between table and wall, by bringing the person into the table slightly. That design, coupled with the angle at which the table is set, gave us more room than we were expecting.

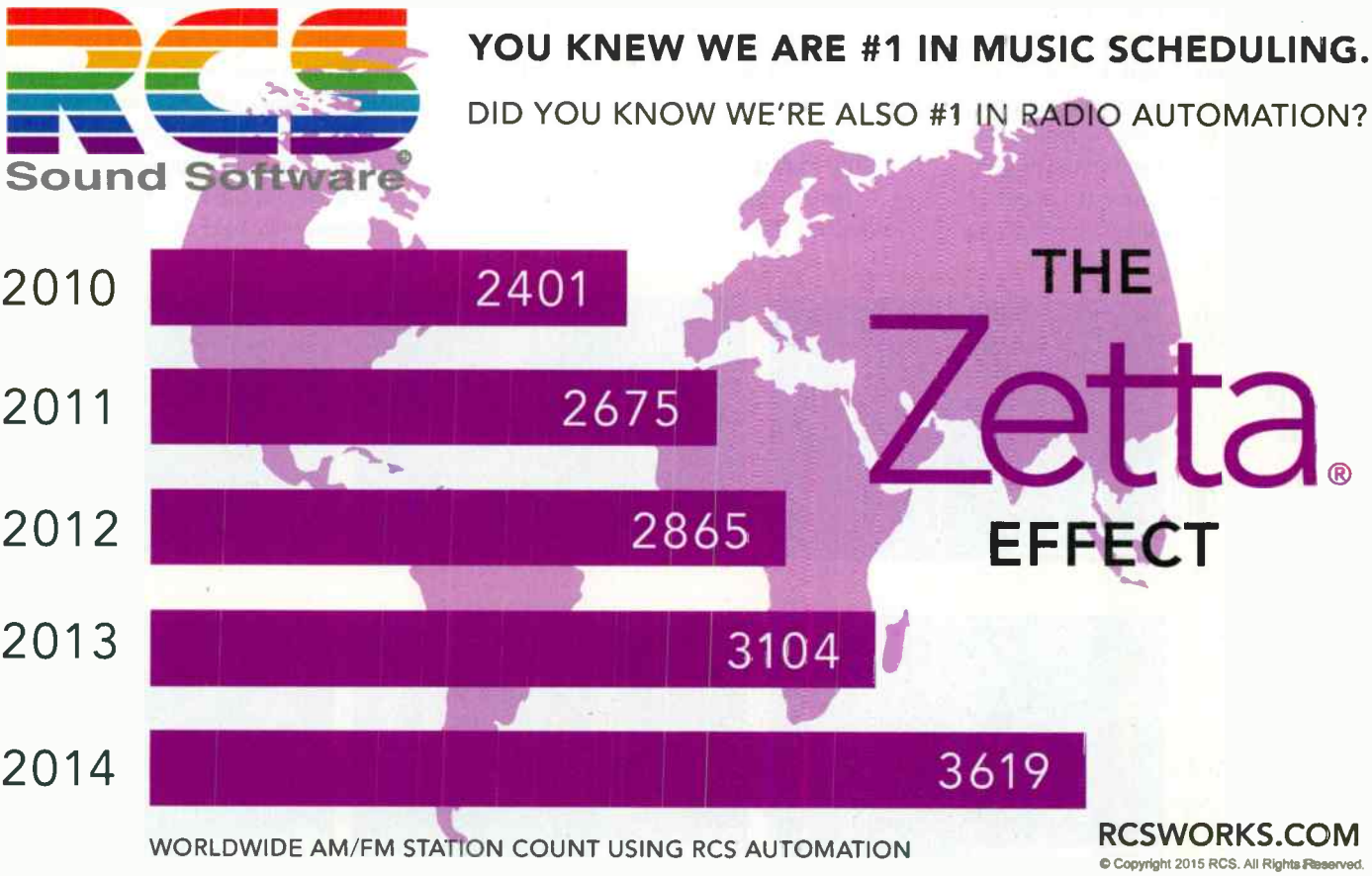
We were able to economize our furniture cost because we had two studio groups that were of the same shape and size. This allowed us to design two furniture layouts, instead of six. The design consisted of an L-shaped top, including Omnirax rounded edges, where the board operator and host would sit. The host position is a little cramped because the side leg of the desk needed to be very close to the end of the top; Holland made a cutout on the lower side of the leg that allows the host to sit by sliding his or her feet under the desk, instead of hitting them on a flat edge by the floor.

One of the small rooms posed a unique problem: A column was in a corner where the desk was located. Holland was able to navigate the tabletop and wiring paths around this column and still keep the top as one piece. After dropping in the console, there was little space for anything else, and we were out of room for the Neumann LH 65 tabletop speaker stands. We eliminated the base, drilled through the top and bolted them through the top. Since Omnirax products are thick, the stands are sturdy, even with the 14.4 pound Neuman KH120A mounted to it.

Studio C has room enough for three guests and a host.

VIDEO PRODUCTION

Our video production required special attention with equipment selection and lighting design for both the TV studio and Studio



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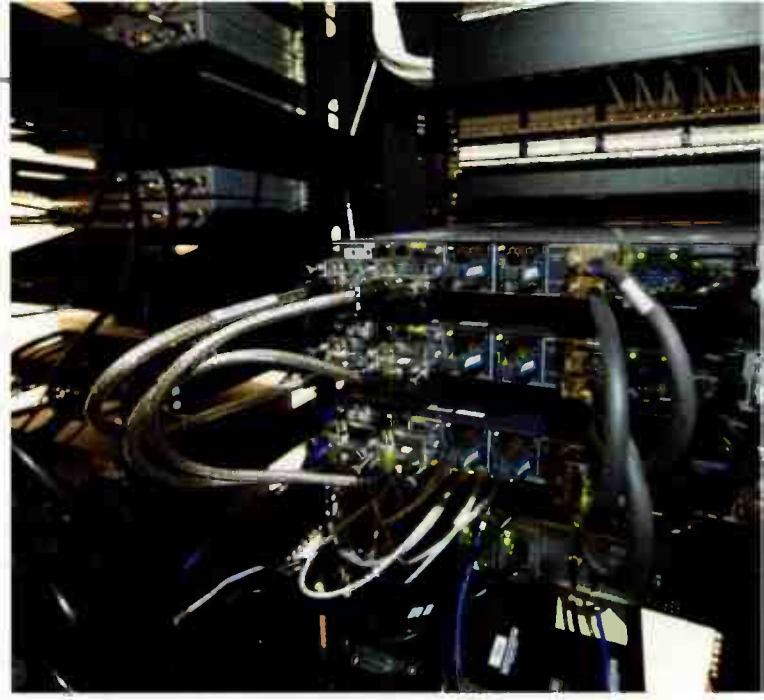

Rear view of the Cisco 3750 switches in Server Room 407.

A. We contracted with Clair Solutions out of Nashville, Tenn., to assist with the design and installation of the video equipment and lighting in the facility. Regional Vice President Dan Heins and his team took our concept for the studio and created two fully functioning video production studios.

The control room centerpiece is a Newtek Tricaster 8000 video production system with eight Sony BRC-H900 full HD robotic cameras (four in the TV studio and four in Studio A). Along with the Sony RM-IP10 remote camera controller, we have full control over all eight cameras with multiple selections of presets. Additionally, we have a Colbalt Digital Inc. OG3-FR openGear 2RU frame with 9002 3G/HD/SD SDI distribution amplifiers, 9910DA-AV Analog Video distribution amplifiers and a D6201B AES/EBU Distribution Amplifier. We installed the Sennheiser EW500 wireless systems with DPA 4061-BMK lavalier microphones for talent, with Sennheiser A2003-UHF antennas. We use Lectrosonics RMP IFB transmitters with Lectrosonics IFBR1A-25 beltpack receivers for IFB to the talent and floor operators. Omnirax designed a long desk that could accommodate a switching position, lighting control, director, audio control and prompter control. Later in the project, we added a Newtek Tricaster 410 in our training room with a ceiling mounted Sony BRC-Z330 robotic camera controlled by another Sony RM-IP10 remote.

Lighting for the TV studio is controlled by an ETC SmartFade 1248 console located in the control room. Several presets are stored and controlled in both studios by four Interactive Technologies SS-305 DMX controllers; these give the average user a quick selection of lighting presets without having to dive into the SmartFade console. We have 12 Litepanels 903-1001 1 X 1 Mono daylight spot fixtures, 22 various ETC Source Four fixtures and five Altman LED Spectra Cyc 100 RGBA cyclorama wall wash luminaires, hanging from a 1- to 1.5-inch schedule-40 black iron pipe grid. Particular attention was paid to assure that our three-wall full cyclorama wall was evenly lit for our green screen productions. Clair Systems had their top designer on-site to locate, focus and program the lighting in both studios.

AUDIO PLANT

Our entire audio facility is built around Wheatnet IP. We chose Wheatstone because we believe that they build the most reliable and robust IP audio networking systems and that the programming is simpler than competing systems.

We installed the Wheatstone E-1 consoles in all our studios, except an LX-24 in studio A. Most of our studios use the IP88CBE blade for the DSP engine with predefined connections and connectors for control room and studio monitors, cue output and headphone output. In the main rack room, we use a Wheatstone Aura8-IP Blade with eight individual stereo multiband processors to pre-process all of our Comrex and Tieline feeds. We installed Wheatstone M4-Ip four-channel microphone processors that have direct connections to

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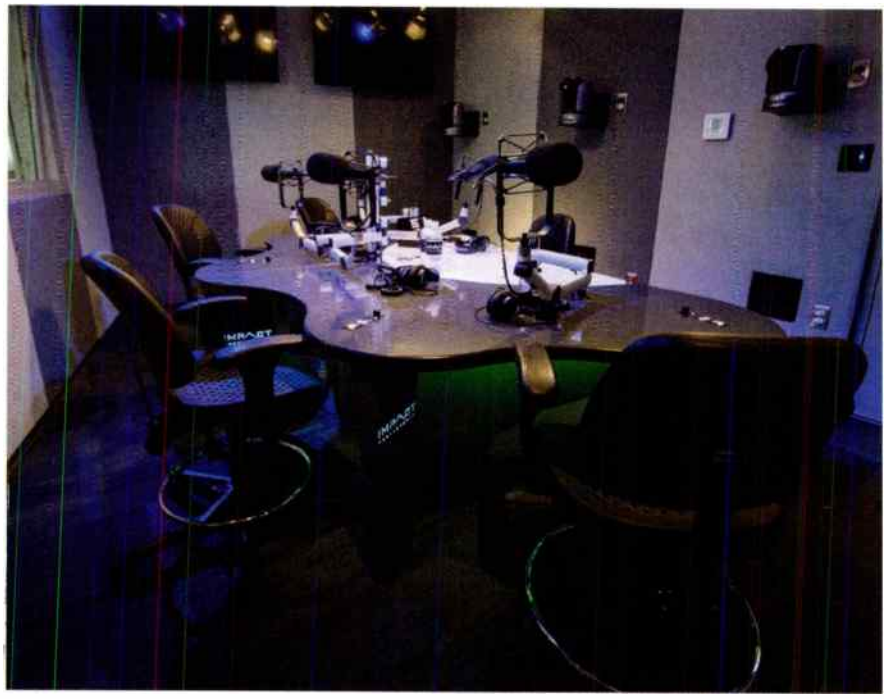
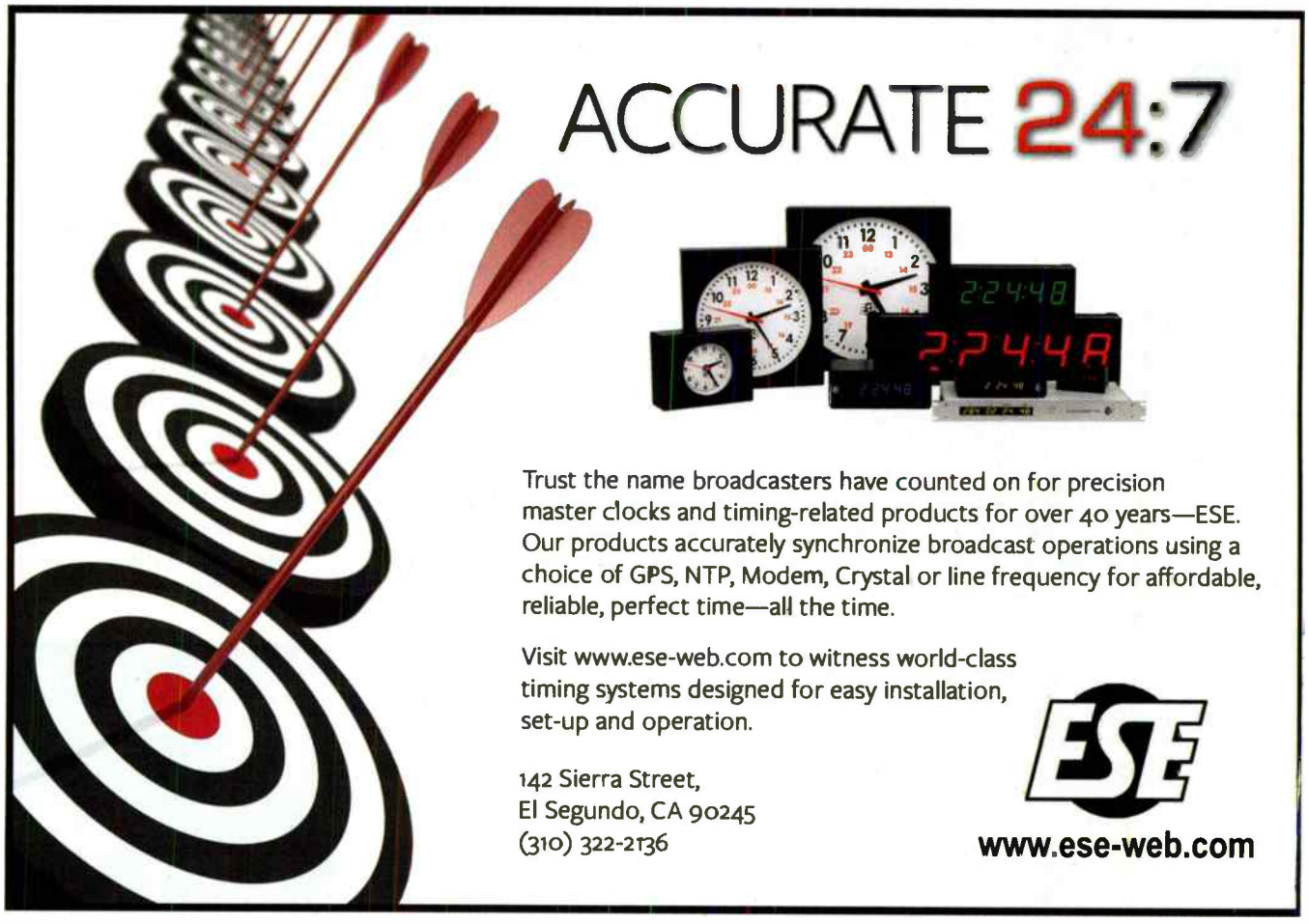
WheatNet-IP. All of our cabling is Cat-6E and our core switch consists of three Cisco Catalyst 3750-X switches with stacking cables. We located the studio PCs in the main rack room with Gefen EXT-HDKVM-LAN KVM extenders and Wheatstone IP drivers so that there is no need for audio cards.

Telephony has always been a thorn in the side of many broadcast engineers. No matter how hard we try to have the highest quality audio throughout our facility, there is always a need for telephone audio at some time. That's where we made the call for the Telos VX system. Telos has always been known for high-quality telephone hybrids, and now the VX system bridges the gap to SIP. We have a Mitel MiVoice 7.0 SIP phone system that we configured to talk directly with the VX engine. This gives us the the full functions of our PBX with the quality of SIP lines. Each studio has a VSet6 with six extensions. The I/O of the VX is AES, so there is no loss of audio quality integrating into our WheatNet-IP system.

No matter what size project is underway, proper planning and design can make the difference. Working with the right vendors can make all the difference. We could not have completed this project, on time and under budget, without Omnirax, Wheatstone, Telos, Clair Solutions and Broadcasters General Store offering solutions, innovations and exceeding all expectations.



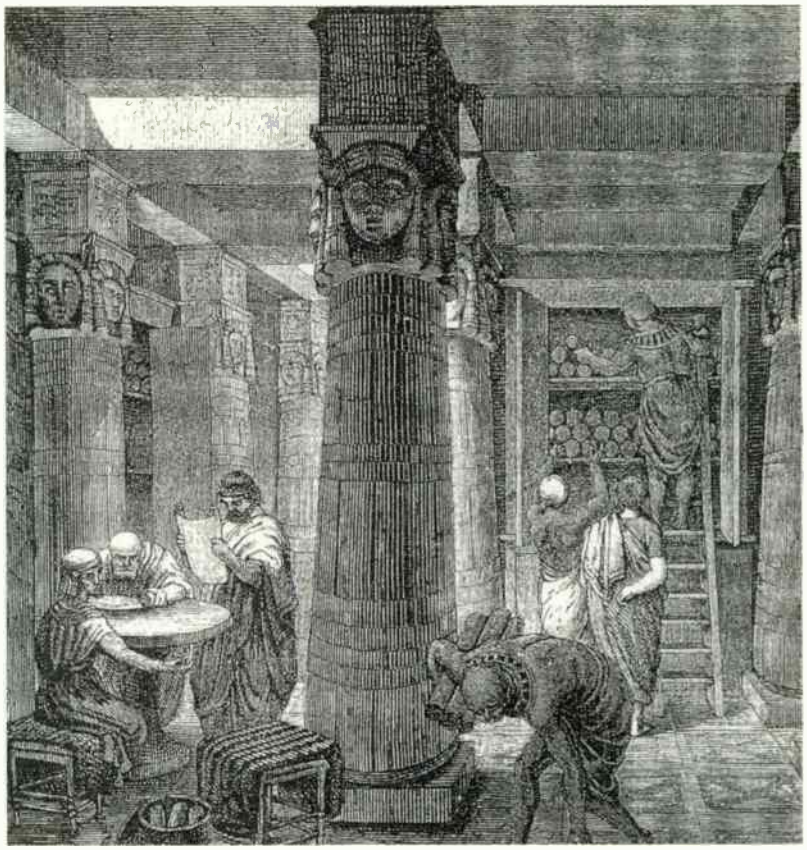
Studio A, with its Sony BRC-H900 cameras



World Radio History

Where Is Your Pinakes?

by Scott Bridgewater



So far in this series about disaster management and recovery, I've outlined simple ways to get started on a workable disaster recovery plan for your station and described useful IT tools to help you prioritize what you need to do to prepare for an incident. This time, I'll talk about your content — and where it lives.

ANCIENT HISTORY

Here's a case study from the third century A.D. about disaster recovery, content, backups and metadata. Scholars disagree on the details of the construction of the Library of Alexandria, but the outlines are pretty consistent.

The library was part of a larger complex called the Museum of Alexandria, a center of research, knowledge and national pride for Egypt built in the third and fourth centuries A.D. Ptolemy I Soter, a general in Alexander the Great's army, built it and sponsored scholars who worked there, who included Euclid.

Its charter was to collect all of the world's knowledge in one place, and by most estimates, had at its peak several hundred thousand scrolls. Aside from searching out books at book fairs, scholars at the library employed a clever way to have books come to them: As ships came to the port of Alexandria, they were required to surrender any books to the library. The books were copied and the copies were returned to the traders, while the originals were stored in the library.

The library remains in our minds and in our culture today largely because it was destroyed

World Radio History

in the legend of the burning of the Library of Alexandria. In the historical record there doesn't seem to be one single burning event. The first incident was during the time Julius Caesar's armies were besieged at Alexandria in 48 B.C. He ended up burning his own ships, which then accidentally ignited the library. Oops. There are other burnings in history, including Emperor Aurelian's taking of the city around 270 A.D., then again in 391 as part of a purge of "pagan" institutions, and yet again in 642 A.D. by order of the Caliph Omar, among others. The library didn't survive into the Dark Ages.

While some knowledge was lost — and that part is definitely a tragedy — remember that the vast majority of the scrolls in the library had copies in existence elsewhere. There were copies at libraries in Constantinople, Baghdad and Gondishapur — the sources of texts for the early medieval universities in Europe. Relatively little science and literature was irretrievably lost.

Almost all stations and media organizations now have their own Pinakes in the form of centralized content management and playback systems.

In modern terms, the library had an extensive set of backups, an important part of any disaster recovery plan. This was not a planned strategy; communication and moving items across long distances in classical times make it likely that scrolls were copied in other places simply so scholars could have access to them without going on long, dangerous journeys. Protection against disasters was at most a secondary consideration, but turned out to be the most important strategy for preserving knowledge into modern times.

ORGANIZATION IS KEY

So what was the real tragedy? The Library of Alexandria lost its way to find and use its content. The library had the first content index that used content and practical metadata to organize the collection and make individual works easily findable.

The Pinakes — ancient Greek for "tables" — was a 120-volume reference that listed the contents of the library and where to find individual works. Callimachus, a Greek scholar, invented it and created the system that divided the scrolls into six genres and five categories based on their content and their author. The Pinakes gave the location of the scrolls within the library and had

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an understandable way to not only discover if a particular work was in the library, but where to locate it. It was conceptually no different than a modern content management system; the only thing missing is playback.

Almost all stations and media organizations now have their own Pinakes in the form of centralized content management and playback systems. That's the index; it's the way you find and manage your station's content. Instead of piles of CDs (and records!) stacked up in a library (or piled in the PD's office) accessed by shuffling through physical objects, everything, including your interstitial matter and spots, are now organized and findable in one place.

METADATA

Content management systems are driven by metadata associated with the content. Each item in your station's content stores has metadata that describes each item by its content – length, genre, author/artist, etc., equivalent to the Pinakes' sorting scrolls by genre and category. Each item also has practical metadata that helps your content management system find and use it: items like file location, which content store it's part of, the "real" file name (if your content management/playback system has "human" and "machine" names for the content items), et.al. This practical metadata is equivalent to the Pinakes giving the location of each scroll in the Library.

The Pinakes was a huge invention; it made content findable and usable by scholars. The combination of a huge collection of "all of the world's knowledge" and a way to efficiently find works and combine ideas made the library and the museum the best place in the classical world to do research for a few hundred years.

The combination of a huge collection of "all of the world's knowledge" and a way to efficiently find works and combine ideas made the library and the museum the best place in the classical world to do research for a few hundred years.

It's not clear when the Pinakes itself was destroyed or lost. At some point, scholars didn't have a way to find the works they needed — or to figure out if a particular work was even still in the library. Major research stopped at the library and moved to places like Constantinople and cities farther east. It's entirely possible that those research libraries had their own version of the Pinakes, a critical tool in information management that's continued in various forms to today.

STORAGE AND MITIGATION

Think about how and where your content is stored — and how to mitigate the danger of losing it. If you still have a lot of physical media (like albums and CDs), take a good look at your library and think about how to back up that probably irreplaceable content somewhere offsite; this would be a good time to start thinking about a digitization project.

Let's say you have been diligent about moving all your content into one (or more) content management systems/playback systems/archives. What happens to your ability to work and to play that content if you're forced from your main studio?

Your disaster recovery plan must include an ongoing program of keeping offsite stores

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of the bulk of your content — even high-density disc backups are better than nothing. Keeping an identical copy of your content storage at your backup location is the best and fastest way to get back up-and-running again.

How often should you backup your content? That's dependent on your RTO and RPO (remember, recovery time objective and recovery point objective from my last column?) analysis of how you use content at your operation. Some music stations may not need 100 percent of their primary storage available at a backup site, so they may have a very tolerant RPO and could stand to lose some content during an incident.

Some news stations, on the other hand, may need at least the last few weeks of news content available at the backup site; they have a much less tolerant RPO, which drives more frequent backups of your content at the recovery site. In those cases, daily isn't too often, and a system that continuously backs up content as it's posted in station storage may be a good way to go.

And you need your Pinakes, too. It's not enough to simply have bulk storage backup; you need a way to find and play your backed-up content. This could be as simple as a standalone content management/playback system from the same vendor you use for your station's playback systems. Make sure that the playback system can access and play from the content stores at your backup site. Think very carefully before putting in a system that's different from the one that your staff is accustomed to using every day; it's not a good idea to be working with unfamiliar tools during an incident.

Putting a playback system at your backup site is an investment; think back to your RTO and RPO analysis. How long can you afford to not have access to your stored content, including underwriting announcements or commercials, before it starts costing your station money and reputation?

Keep in mind that some incidents don't involve your surrounding community and are invisible to your listeners; we're talking about things like building power or HVAC failures that only affect your operation. In those cases, you need to keep your on-air presence as seamless as possible, which means that the old "drag a bunch of CDs to the transmitter" plan is now completely unworkable.

Are you covered if you have your content backed up in multiple places, and have good ways to find and play it? Possibly, but you can't be sure until you test it — and that's the next installment.

Bridgewater works with radio stations, program producers and other media companies to help them solve sticky problems, including analyzing and enhancing their disaster recovery preparations.

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These Steps Make Your Job Easier

by Doug Irwin
CPBE AMD

In the last installment of Tech Tips, I wrote about getting your own shop up and running at a radio station. We'll continue this month.

A brief review: We started off equipping the shop by getting a good soldering iron and learning how to use it; we obtained a set of hand-tools; we obtained a cable tester; and we obtained a signal generator, a signal receiver, and a digital multi-meter (DMM). Finally, we made up a set of custom cables to get signals in and out of the console; and, a headphone adaptor to use to track analog audio.

Here are some additional steps you can take to make your job easier.

Store rack-mounted gear on its side for quick removal.

Working area. If you happen to have an IT background already, then you know a clear workspace is a necessity. Every shop area needs a place to set a piece of gear down where you can proceed to tear it apart. Your radio engineering shop has the same need. I'd also suggest that you obtain some small containers to hold parts, screws and other miscellaneous pieces of projects that are in progress. You can get those at your local grocery store.

By the way, keep this workspace separate from your normal work area—that is, where you get on the computer, answer the telephone, etc.

Find vendors. What you'll find out in this new job is that the same things break over and over. You'll also find a need to have a quick way of getting supplies.

I suggest getting together with whoever pays the bills at your station and making sure some accounts are set up at any electronics vendors that might happen to be in your town. If your town has nothing (not many do), then work at getting accounts set up with vendors that can ship you stuff quickly. Some of the most well known ones are Digikey, Markertek and Allied Electronics. You can find them all easily enough online. Then, purchase parts you need to make up the usual cables you find around the station; have XLR connectors, and of course, RJ45s on-hand. Also have cable on-hand.

Equipment-specific parts. It's important to have stock on items that break frequently: switches, faders and perhaps other items that are handled by on-air staff frequently. Make sure you are on good terms with your console manufacturer—you don't want to have a need for parts that cannot be fulfilled because you don't have an open account with them.

Contact cleaner. If you happen to have some "old" consoles to maintain, I want to recommend my favorite "contact enhancement liquid." (I call it that because it's more than a cleaner.) Obtain a small bottle of "Stabilant-22" from Amazon. Use it sparingly—a little goes a long way, and it's quite expensive.

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Equipment spares. Again, as in the IT side of the business, ready-spares are of great importance for radio. Here are some of the most generic spares that you should have:

- Console fader modules. Take time to obtain spares, or when the circumstances allow, remove spare modules from a console, make sure they're 100-percent operable and put them on the shelf. Don't store them in the console. You never know what might get spilled on them.
- Spare automation computer. Easier said than done, I know. Of course, your circumstances will dictate which "spares" are most important; different automation systems will have different ready spares. Sit down and figure out what the most likely failure is—and then have something on the shelf to cover it.
- Studio-to-transmitter components. Again this will depend upon what system you are using. If you have a radio STL, then make sure at least one other transmitter and one other receiver are available. Ideally they'll be racked up and ready to go, by way of remote control. And they don't necessarily need to be the same make/model as your main set. Just make sure they are on the same frequency (obviously) and make sure "throughput" gain is the same, so that when you switch to them, you'll have the correct modulation levels as a result.

A clean workspace allows focus for the job at hand.

The 24/7/365 nature of radio can make it a difficult job. If you want to succeed in this line of work, the key is preparation. You need to be ready to respond when circumstances warrant—so having problems figured out ahead of time is very important.

I'm not suggesting you can read the tea leaves and know what the next thing to break will be; rather, I'm suggesting that you break down your system in to its key elements, and then make sure that you have a way to backup each of them. Figure out responses to potential problems during normal business hours, when you're at your best—not at 4 a.m. on a Sunday morning during a snowstorm.

Remember, if you have any of your own Tech Tips to share, by all means send them in to *radio@radiomagonline.com*. We're always interested.

Irwin is RF engineer/project manager for Clear Channel Los Angeles. Contact him at doug@dougirwin.net.

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APRIL ISSUE

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He won a Hosa CBT-500 cable tester from Hosa Technology.

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The mic was hiding on the left end of XDS VME-5 satellite receiver next to the headphone jack.

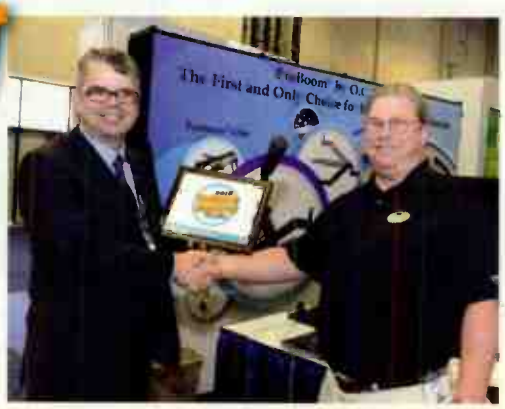
The winner is drawn from the correct entries for the issue two months prior. No purchase necessary. For complete rules, go to RadioMagOnline.com.

World Radio History

2015 BEST of SHOW Radio

Here are the winners of the NewBay Media Best of Show Awards from Radio magazine, part of a broader awards program that encompassed 250+ nominated products and seven NewBay publications. Exhibitors at the spring NAB Show submit for consideration and pay an entry fee; winners are selected by panels of engineers and editors. To see all the nominees, visit the Best of Show Program Guide. Go to radiomagonline.com/bos2015

(Photos by Jim Peck)



O.C. White introduced the ProBoom Ultima family of low-profile microphone booms and scalable monitor systems. The Ultima LP Mic Boom features a weight rating of 0 to six pounds and a counterbalance design. It has a table top-hugging design, and the company provides integrated wire channeling down the arm and an internal spring design. The main articulating mic boom section features about 10 inches of height adjustment, as well as a 5/8"-27 mic stud swivel. This adjustable section comes paired with one 12-inch horizontal arm, and more arms can be added. An available mic arm solution is the 12-inch Vertical Modular Clamp/Riser Assembly, which enables up to four Ultima LP arms to be mounted. The Ultima LP Mic Boom has five mounting options.

The Ultima SMS monitor system is a companion to the Ultima LP series that can support up to six 20-pound flat-panel monitors, as well as offer a common mounting platform. Ultima SMS is available as a package or à la carte.

Richard L. May, right, accepts from Radio's Doug Irwin.

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2015 Best of Show Radio

Wheatstone Corp.'s WheatNet-IP Network Edge is designed as a translator between the low-latency WheatNet-IP audio network and high-latency, low-bandwidth STL connectivity options that are becoming more widely used. The unit offers a large installed base of WheatNet-IP customers an alternative to a full-featured I/O Blade access unit for these lower-cost transports. The WheatNet-IP Network EDGE is AES67-compatible, and includes local I/O and programmable logic ports.

Shown are Phil Owens, Mike Erickson, Jay Tyler, Paul Picard and Kelly Parker with Doug.

Nautel's NT 5 and 10 Digital/Analog AM transmitters bring the company's efficiency approach to the 5 and 10 kW range.

They feature efficiency of 86 percent; compact enclosures that are a quarter to a third smaller; and digital transmission capability. Front-panel control is via an easy-to-use LCD display. Like other members of the NX Series, the 5 and 10 kW models include Nautel's Advanced User Interface. Log into the AUI on the NX 5 and 10 using a Web browser to gain access to instrumentation and control.

Alex Morash, Chuck Kelly and Kevin Rodgers are shown here with Doug.

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Shure made a splash with its Motiv Digital Microphone line. "The explosion of mobile device use has ushered in an entirely new era for the content consumer and also changed the game for content creators," the company says. Its new lineup is intended to help video and audio professionals capture quality audio on the go. These portable devices are plug-and-play, with a nifty retro design and 24-bit/48 kHz audio.

The line includes the MV5 Digital Condenser Microphone, MV88 iOS Digital Stereo Condenser Microphone, MV51 Digital Large-Diaphragm Condenser Microphone, MVi Digital Audio Interface and an iOS Mobile Recording App.

The MVi Digital Audio Interface connects any XLR microphone or 1/4-inch cabled instrument to an iOS device, Mac or PC. It has five DSP preset modes and includes Shure's onboard touch-panel control for access to gain, phantom power, mute and headphone volume adjustments.

In the Shure booth are Soren Pedersen, Tim Balgemann and Ryan Perkofski with Doug.

Broadcast Bionics Virtual Director allows on-air staff to capture and share video, audio and still photos from the studio with social platforms such as Facebook, Twitter, YouTube and others. Using mic levels, fader positions, music playout and social media information, the company says, Virtual Director also creates a rich TV experience without additional staff or complexity.

The manufacturer says that a historical problem for visualization systems has been "what to show" when microphones are off. Traditional radio lacks the sharing habit and social media hooks, which images and video from visualization can provide. The social integration aspect of Virtual Director also blends artist and album art images alongside tweets, texts and EPG information to keep the audience engaged during all parts of a radio show.

Duncan Smith is shown here with Doug and Emily.

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BW Broadcast says eliminating "dead air" is a must for any serious broadcaster and that's why it introduced the Plan B Encore. It describes Plan B as a cost-effective 1 RU silence detector and back-up audio player, designed to keep a station on-air when the normal program sources fail, for whatever reason. Potential back-up audio sources include internal flash memory; external USB; an IP stream; and, local audio inputs on the rear.

You can set up and monitor Plan B by way of an IP connection, making use of HTTP or telnet. In the event of problems at the transmitter site, Plan B will communicate actions it has taken to station personnel via email or SNMP.

Neal Helly, Ricardo da Silva and Gino Canzano take home the prize, flanked on the left by Emily and on the right by Doug.

ENCO's enStreamer is a dedicated-hardware audio and video playout device, built on a modified Raspberry Pi platform, for broadcast, studio transmitter links, in-store radio and digital signage applications. Intended to be a primary or a failover device, it can decode a continuous stream of audio or receive audio and video files with playlists, even over slow WAN links, and store them locally for later automated playout. Each unit is able to overcome interruptions to the live stream by switching over to local playout automatically.

Other features include dynamic file transfer and local playout for regionalized content; transmission of "as played" logs back to the station for log reconciliation; and remote scheduling of timed events. Eugene Novacek is shown with Doug.

World Radio History

2015 BEST OF SHOW Radio

Inovonics won for its SIMON 614 Multiple Stream Monitor. It offers simultaneous monitoring of up to four separate Internet Radio streams, with an intuitive Web interface that supports email, SMS alarm messaging and SNMP. It is compatible with most audio networking protocols (HLS, HTTP/S, MMS over HTTP or TCP, RTMP, RTSP, RTP, TCP, UDP, TLS) and both lossy and lossless audio encoding standards (MP4, Ogg, webm, MPEG-TS, MP3, AAC, AC3, DTS, Vorbis, WMA 9, Opus, MP2, AMR, Speex, .wav, FLAC, ALAC, WavPack, MPEG-4, ALS). Other features include accurate display of audio levels and important metadata; alarm tallies and logging for audio loss and stream loss; a full-featured remote Web interface; analog and AES3 digital outputs; and configuration using the OLED display and jog-wheel.

Shown from left are Gary Luhrman, Jim Wood and Ben Barber with Doug.

WorldCast Systems says its APT SureStreamer enables broadcasters using single-port IP audio codecs to reduce costs or increase the reliability of their system. This release makes SureStream available to those operating IP audio codecs from any manufacturer, and adding the APT SureStreamer into the network to achieve the quality and reliability of a managed service (or T1 /E1 link). It is an add-on device inserted between the existing IP audio codec and the network. The SureStreamer sends the same audio content over divergent paths for increased redundancy, then ensures one reconstructed stream is produced by the decoder. A further application helps reduce costs associated with feeding multiple codecs acting as decoders. The SureStreamer can act as a "multicast or multiple unicast node."

Shown are Eduardo Villanueva, Kevin Campbell, John Lindsay, Bruno Rost, Gregory Mercier (rear), Christophe Poulain, Tony Peterle, Doug and Tatiana Lisman.

DEVA Broadcast's FM/HD Radio & IP Audio Confidence Monitoring Receiver is a DSP-based tuner that allows monitoring of the HD Radio, FM and Internet streams of the station selected by its front-panel controls, or via remote IP access. In addition to real-time monitoring, it measures and stores, for future analysis, the RF level and left & right audio levels. The DB3011 has built-in FM RDS/RBDS Decoder and HD Radio PAD Decoder as well.

The DB3011 is equipped with two speakers to reproduce mid- and high-range audio frequencies, and high-efficiency bass reflex speaker for high-quality sound. In addition to its FM and HD Radio monitoring capability, it monitors your online stream simultaneously, supporting AAC, AAC+, MP3, RTP and PCM IP audio codecs.

Todor Ivanov poses with the award, between Doug and Emily Reigart (Radio).

Nautel introduced its new HD Multiplex. The company says that this new technology will enable placement of up to 15 audio streams or radio stations within 600 kHz of signal bandwidth, or up to nine streams in 400 kHz of signal bandwidth.

This isn't a product you can buy; Nautel said it demonstrated a working prototype to foster discussion. But it envisioned for instance that a station considering HD conversion might test the waters by leasing a stream on a multiplex; AM stations could be moved to the FM band, as proposed by some countries; netcasters could place popular streams on an over-the-air signal. "In many cases, this could provide new revenue for broadcasters through leases or ad insertion in the various streams. Further, small markets could have a broad variety of diverse formats served by a single low-cost station."

Depicted are Kevin Rodgers, Chuck Kelly and Philipp Schmid with Doug.

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8 KW	1997	CCA FM8000G, single phase
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20 KW	1989	BE FM20B
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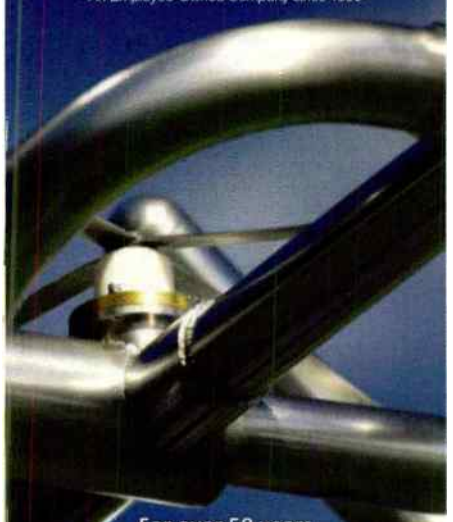

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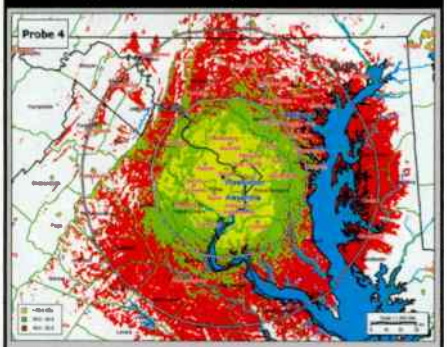

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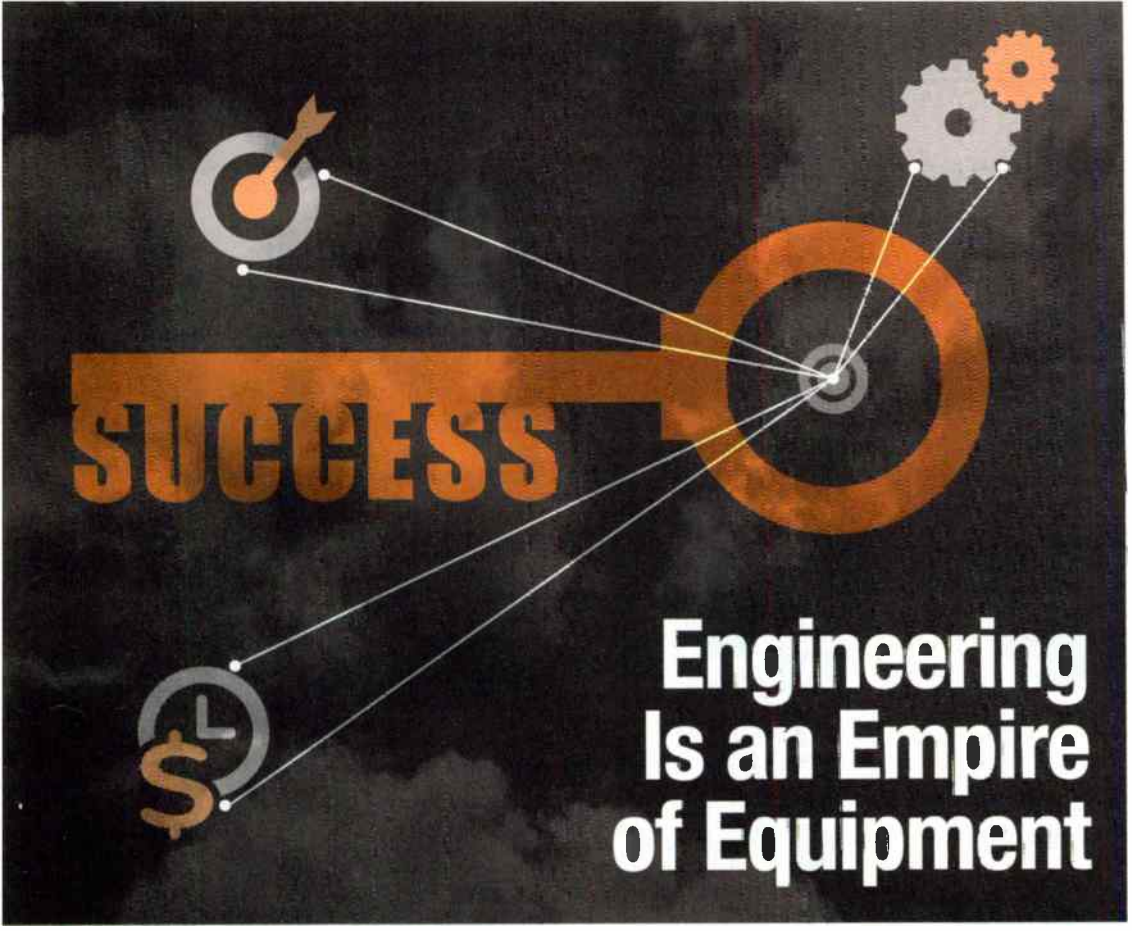

Engineering Is an Empire of Equipment

by The Wandering Engineer

Not all that long ago, NAB ran a course at Purdue University for broadcast engineering managers. No one was worried about lack of technical skills and nothing digital ran fast enough to do more than print out one page at a time on something that looked and worked like a glorified typewriter. Traffic led the digital way using what was essentially a very expensive word processor with a tiny added brain to calculate times and sort.

What managers did worry about were people skills. Engineering had grown into departments and groups in need of management and some engineers had even become general managers. On balance, they were not very good at it.

Who becomes a station general manger is both fascinating and telling. It has also changed over time. At first, it was not uncommon for engineers to be the station manager or owner. GMs tend to come from the most important functional area and at first, getting on the air, then staying on the air was the big challenge.

In the depression, sales managers became GMs, largely because staying on the air wasn't so much a technical challenge as it was a financial challenge.

Sales people are often difficult GMs because, like engineers, their skill set doesn't necessarily make them good overall managers. For example, a trait that is necessary for a salesperson is the ability to shrug off rejection without emotional cost. Shrugging off the rejection of a station's staff being held back from making improvements isn't a strategy for success.

In the better days that followed World War II, GMs could come from anywhere. It turns out that the decision-making and leadership skills exist in parallel to other skills without direct connection. Anyone might become a great GM.

Human resource managers, business managers, even an occasional program director has served as a GM. Some of the best GMs had worked in other media and a few in no media at all. America was in so many ways the world leader in leadership and management in all of its endeavors. Universities taught management and studied leadership. Every month, a new book on management hit the top of the bestsellers list and for a few months took its position revealing the new one and true secret to success.

Today, consolidation has created large tribes of stations where each station looks more or less alike. The GM is more a function of corporate culture than anything else. Groups focused on news will have a news director at the helm of each station giving them the power of having in effect dual news directors. More investment-oriented groups will have business managers across the board in the GM slot. Others will manage their stations with sales managers setting the pace. Special message stations and groups will have true believers in charge.

Engineering isn't the only function in a station that is nearly invisible, but the reality is that no group of any size is dominated by engineering.

There is little chance that an engineer will be a station GM, unless the station is very small or they own it (which generally means it is a small station). Engineering is an empire of equipment, rather than of people. As broadcasting virtualizes, it seems likely that it becomes an empire of software that lives in the cloud.

Engineers, on balance, probably aren't any better at those soft skills today.

The old NAB course, once supported by broadcast owners, faded away in time. Ownership changed as the era of first-generation owner/operator broadcasters (who had to work with their engineers or be engineers themselves) was replaced by investors who hired people to manage their properties. In most of the industry, investing in engineering people management skills was supplanted by the need for project management and technology management skills. Engineers didn't get any better at soft skills. It's a cruel reality that a mind with the knack for technology often has little patience for and understanding of the rest of humanity. Nonetheless, the management training came back, not because broadcast owners at NAB thought it a good idea, but because engineers did. Of course, the direct offspring of the NAB engineering management series is now the SBE's. No one can teach anyone how to manage, in particular in a day or a week. On the other hand, no one who took the Purdue engineering management course and courses (there are several levels) likely escaped without profound changes in how they approached managing and being managed.

The Wandering Engineer is an industry stalwart who has been in broadcasting since the days of Marconi and Tesla. He gives his thoughts on the current state of broadcast engineering and the broadcast engineer.

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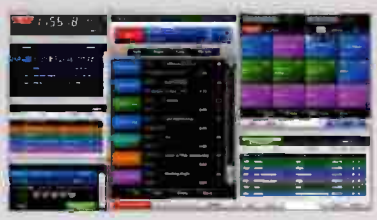

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